

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization International Bureau



1 TO BE ON THE REAL PROPERTY OF THE PROPERTY O

(43) International Publication Date 22 July 2004 (22.07.2004)

(10) International Publication Number WO 2004/060861 A3

- (51) International Patent Classification7: G02F 1/1337, C09K 19/38
- C08F 246/00.
- (21) International Application Number:

PCT/EP2003/050926

- (22) International Filing Date: 2 December 2003 (02.12.2003)
- (25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

2074/02 1095/03 6 December 2002 (06.12.2002) 23 June 2003 (23.06.2003)

- (71) Applicant (for all designated States except US): HUNTS-MAN ADVANCED MATERIALS (SWITZERLAND) GMBH [CH/CH]; Klybeckstrasse 200, CH-4057 Basel (CH).
- (72) Inventors; and
- (75) Inventors/Applicants (for US only): STUDER, Peggy [FR/FR]; 13, rue du Président Wilson, F-68330 Huningue (FR). SCHEIFELE, Patrick [CH/CH]; Witterswilerfeldweg 35, CH-4106 Therwil (CH). STÖSSEL, Richard [CH/CH]; Rösernstrasse 38, CH-4402 Frenkendorf (CH). MATSUMOTO, Yonetatsu [JP/JP]; 2-2-33 Mikatadai, Nishi-ku, Kobe, 651-2277 (JP). BARNY, Stefan [CH/CH]; Stallenmattstrasse 5, CH-OBERWIL 4104 (CH).

- (74) Agent: MAUÉ, Paul Georg; Solvias AG. Patents, WKL-402.3.04, Klybeckstrasse 191, CH-4002 Basel (CH).
- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.
- (84) Designated States (regional): ARIPO patent (BW, GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

- with international search report
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments
- (88) Date of publication of the international search report: 30 September 2004

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: CROSSLINKABLE, PHOTOACTIVE POLYMERS AND THEIR USE

(57) Abstract: Copolymers composed of (a) at least one monomer from the group of acrylates, methacrylates, acrylamides and methacrylamides, to each of which is bonded covalently, directly or via a bridging group, a photochemically isomerizable or dimerizable molecule, (b) at least one polyoxyalkyl ester or one polyoxyalkylamide of an ethylenically unsaturated monoor dicarboxylic acid, or one polyoxyalkyl ether of an ethylenically unsaturated alcohol, and (c) optionally, other ethylenically unsaturated comonomers are outstandingly suitable as alignment layers for liquid crystals.



Intelligional Application No PCT/EP 03/50926

| A CLASSIF IPC 7 | COSF246/00 GO2F1/1337 CO9K19/38 | 3 | | | | | | |
|-------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|-------------------------|--|--|--|--|--|
| According to International Patent Classification (IPC) or to both national classification and IPC | | | | | | | | |
| B. FIELDS S | | | | | | | | |
| Minimum documentation searched (classification system followed by classification symbols) | | | | | | | | |
| IPC 7 | C08F 602F C09K | | | | | | | |
| | | | | | | | | |
| Documentati | on searched other than minimum documentation to the extent that su | ch documents are included in the fletds se | arched | | | | | |
| Electronic da | ata base consulted during the International search (name of data bas | e and, where practical, search terms used | | | | | | |
| EPO-Internal, WPI Data | | | | | | | | |
| C. DOCUME | ENTS CONSIDERED TO BE RELEVANT | | | | | | | |
| Category * | Citation of document, with Indication, where appropriate, of the rele | Relevant to claim No. | | | | | | |
| | | | | | | | | |
| Α | EP 0 763 552 A (ROLIC AG) | | 1-26. | | | | | |
| | 19 March 1997 (1997-03-19) cited in the application | | | | | | | |
| | the whole document | | | | | | | |
| | | | | | | | | |
| A | WO 00/59966 A (ROLIC AG ; SEIBERLE HUBERT 1-26 (DE); MARCK GUY (FR); MULLER OLIVIER (FR)) | | | | | | | |
| | 12 October 2000 (2000-10-12) | | | | | | | |
| \ | the whole document | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| ļ | | | | | | | | |
| | · | | | | | | | |
| 1 | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | Data de millo membro a con llated | in cases | | | | | |
| Fun | Further documents are listed in the continuation of box C. X Patent tamily members are listed in annex. | | | | | | | |
| * Special categories of cited documents: "T" later document published after the international filing date | | | | | | | | |
| | ent defining the general state of the art which is not dered to be of particular relevance | | eory underlying the | | | | | |
| 'E' earlier | considered to be of particular relevance hivention E' earlier document but published on or after the international 'x' document of particular relevance; the claimed invention | | | | | | | |
| "L" docum | * earlier document but published on or after the International filing date *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone which is cited to establish the publication date of another *Y* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone document of particular relevance; the claimed invention | | | | | | | |
| citatio | on or other special reason (as specified) sent referring to an oral disclosure, use, exhibition or | cannot be considered to involve an indecument is combined with one or m | iventive step when the | | | | | |
| other | means | ments, such combination being obvid in the art. | ous to a person skilled | | | | | |
| tater | P* document published prior to the international filing date but tater than the priority date claimed In the art. '&' document member of the same patent family | | | | | | | |
| Date of the | te of the actual completion of the international search Date of mailing of the international search report | | | | | | | |
| 5 | 5 August 2004 12/08/2004 | | | | | | | |
| Name and | Name and mailing address of the ISA Authorized officer Authorized officer | | | | | | | |
| European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel (+31-70) 340-2740 TV 31 651 epo pl | | | | | | | | |
| | Tet. (+31-70) 340-2040, Tx. 31 651 epo nt. Rouault, Y Fex: (+31-70) 340-3016 | | | | | | | |



Internal Application No PCT/EP 03/50926

| Patent document dted in search report | | Publication date | | Patent family member(s) | Publication date |
|------------------------------------------|---|------------------|----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| EP 0763552 | A | 19-03-1997 | CN DE EP HK JP SG US | 1151411 A ,B 59607712 D1 0763552 A2 1011035 A1 9118717 A 45498 A1 6335409 B1 6107427 A | 11-06-1997 25-10-2001 19-03-1997 04-01-2002 06-05-1997 16-01-1998 01-01-2002 22-08-2000 |
| WO 0059966 | A | 12-10-2000 | AT AU CN DE DE EP HK WO JP US | 238361 T 3315400 A 1345342 T 60002312 D1 60002312 T2 1171493 A1 1039949 A1 0059966 A1 2002541277 T 6649230 B1 | 15-05-2003 23-10-2000 17-04-2002 28-05-2003 19-02-2004 16-01-2002 22-08-2003 12-10-2000 03-12-2002 18-11-2003 |